

[*SGML Version - See Change Record*]  
TECHNICAL MANUAL

## HEATER BOOSTER, 440/60/3 TYPE AC, 9KW

I/A/W MIL-H-43895B DATED 86 JUN 24 AMEND  
NR 1 DATED 88 MAR 21

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2 JUL 1990



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## SAFETY SUMMARY

### WARNING

**Never service the 3CS heater without turning off the power at the fused disconnect switch or circuit breaker. High voltage is present. (Page 3-4)**

### WARNING

**Never service the 3CS[M] heater without turning off the power at the fused disconnect switch or circuit breaker. High voltage is present. (Page 4-1)**

### CAUTION

**Electrical - Be sure 3CS heater tank is filled with water before energizing the heating element. (Page 3-1)**

### CAUTION

**Turn switch to "OFF" when sink is drained. After sink is drained, the sediment sump should be drained by actuating the valve handle. (Page 3-3)**

### CAUTION

**Shut off power to the heater before draining. (Page 3-3)**

### CAUTION

**DO NOT OVERTIGHTEN NUT OR SLEEVE INSIDE OF BUSHING WILL CUT THROUGH TUBING. (Page 5-2)**

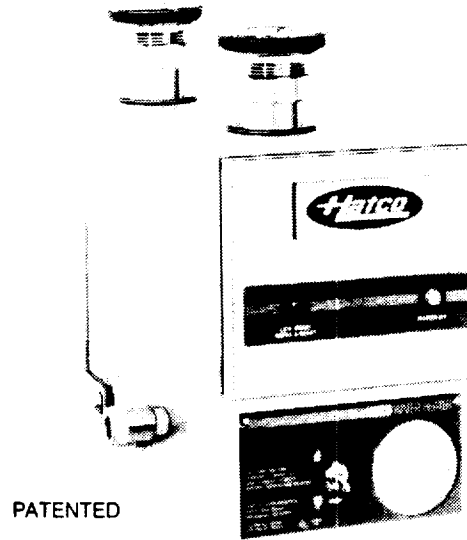
### CAUTION

**BE SURE TANK IS REFILLED BEFORE TURNING ON POWER. (Page 5-2)**



## CHAPTER 1

### SANITIZING SINK HEATER



Sanitized Sink Heater

The Hatco 3CS sink heater makes manual warewashing faster and more convenient. It maintains a continuous supply of 180° F. (82° C.) sanitizing rinse water without taking up valuable sink space. Designed to fit under the sink the 3CS is perfect for 3 or 4 compartment sinks, pot and pan sinks and bar sinks.

- All Stainless Steel Body and Base
- Rinse Temperature Indicating Gauge
- Green "Power On" Light
- Red "Over-Temp" Light
- Mounting Support Provisions

A toggle switch activates the heater and a green light indicates when power is on. An indicating gauge indicates when water reaches the sanitizing 180° F. (82° C.) temperature.



Sanitized Sink Heater In Use

**SIZING INFORMATION** 3CS heaters are sized based on 140° F. (60° C.) supply water with 45 minute or less preheat period to reach sanitizing temperature.

**IMPORTANT:** When ordering, specify: Model Number, Wattage, Voltage, Phase and Accessories.

## FEATURES

The 3CS has a unique dual reservoir system. One reservoir contains the heating element and should always be filled with water. The other reservoir traps and collects soil carried from other sink compartments. It is easily emptied after each use by a convenient drain.

If the sink is drained and the 3CS is not shut off, a thermostat automatically shuts off the heater and turns on a red signal light. This feature saves the elements from over-heating and possible burnout.

## SPECIFICATIONS

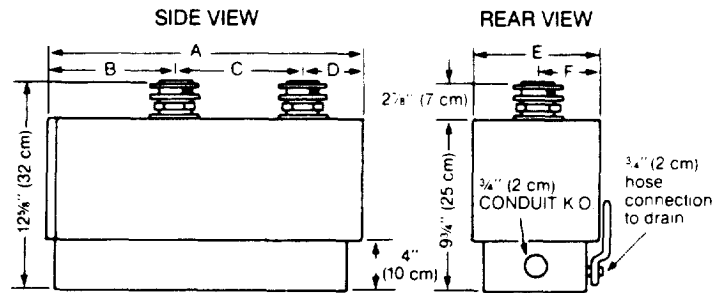
Specifications

| Model    | KW     | Phase  | Volume (cu. in.) | Ship. Wt.       |
|----------|--------|--------|------------------|-----------------|
| 3CS(M)-3 | 3 kw   | 1 or 3 | Up to 5,000      | 28 lbs. (13 kg) |
| 3CS(M)-4 | 4.5 kw | 1 or 3 | 5,001 to 6,500   | 28 lbs. (13 kg) |
| 3CS(M)-6 | 6 kw   | 1 or 3 | 6,501 to 11,500  | 32 lbs. (15 kg) |
| 3CS(M)-9 | 9 kw   | 1 or 3 | 11,501 to 18,000 | 32 lbs. (15 kg) |

## PLUMBING

Standard C.P. brass plumbing fittings are mounted into the third compartment sink. These fittings allow the heater to be detached by opening the unions between the fittings and the heater. Two 2" (5 cm) diameter holes required in sink. A full sized template is supplied to locate fitting holes.

## DIMENSIONS



Dimensions

Dimensions

| Model        | A                | B               | C               | D              | E               | F              |
|--------------|------------------|-----------------|-----------------|----------------|-----------------|----------------|
| 1 or 3 phase | 16<br>7/8"(43cm) | 5<br>1/2"(14cm) | 8<br>1/2"(22cm) | 2<br>7/8"(7cm) | 6<br>3/4"(17cm) | 3<br>3/8"(9cm) |
| Bal. 3 phase | 17<br>1/8"(44cm) | 4<br>5/8"(12cm) | 8<br>1/2"(22cm) | 4"(10cm)       | 8"(20cm)        | 4"(10cm)       |

## ELECTRICAL

Model 3CS(M) is rated at 3 kw, 4.5 kw, 6 kw or 9 kw in 208, 240 or 440 volts. 3 kw thru 6 kw models are available in DC.



## CHAPTER 2

### HATCO MODEL 3CS [M] SINK HEATER FOR ALL THREE COMPARTMENT SINKS DIMENSIONS:

#### DIMENSIONS:

Dimensions

| <u>MODEL</u> | <u>HEIGHT</u> | <u>WIDTH</u> | <u>LENGTH</u> |
|--------------|---------------|--------------|---------------|
| Single Phase | 12-5/8"       | 6-3/4"       | 16-7/8"       |
| Three Phase  | 12-5/8"       | 8-3/4"       | 17-1/8"       |

#### SPECIFICATIONS:

The Hatco 3CS sink heater is available in the following models:

Specifications

| <u>MODEL</u> | <u>KW</u> | <u>VOLTAGES</u> | <u>PHASE</u> | <u>USE WITH<br/>SINK SIZE</u> |
|--------------|-----------|-----------------|--------------|-------------------------------|
| 3CS[M]-3     | 3         | 208-240-440     | 1 or 3       | 12" square or smaller         |
| 3CS[M]-4     | 4.5       | 208-240-440     | 1 or 3       | 16" - 19" square              |
| 3CS[M]-6     | 6         | 208-240-440     | 1 or 3       | 20" - 24" square              |
| 3CS[M]-9     | 9         | 208-240-440     | 1 or 3       | Over 24" square               |

The Hatco Third Compartment Sanitizing Sink Heater is designed for use with any manual dishwashing Operation regardless of size. The sink heater will maintain the rinse water at 180° F. to satisfy the requirements of good sanitation and the rules of the U.S. Health Department. The sink heater will heat the water from a normal 140° F. supply temperature or heat the cold water supply temperature if required up to the 180° F. use temperature. Fresh water can be added as required. The heaters are usually sized to heat 140° F. supply water to 180° F. use temperature with only a 30 minute preheat period.

The Hatco Third Compartment Sanitizing Sink Heater is complete with all electrical wiring and plumbing. Installation is easy and inexpensive. All that is required for the plumbing is the cutting of two 2 inch diameter holes in the bottom of the rinse compartment. Two sink strainer assemblies [provided by Hatco] are mounted in the two holes and the heater is suspended from them. Simple electrical supply to the rear of the heater completes the installation.




#### CONSTRUCTION DETAILS:

The 3CS sink heater tank is constructed of stainless steel. The ball valve is brass, the piping and thermostat probes are nickel plated copper. The heater tank is designed with dual reservoirs. Water from the sink above flows into the 3CS heater directly into the first reservoir that acts as a soil collection sump. Debris that could affect the heating element operation settles out in the sump to be drained away later. The debris-free water flows into the second reservoir in which the heating elements are mounted. The water is heated and returned to the sink above by natural convection.

The electrical system is factory assembled and ready to be attached to the proper electrical supply. The electrical system, includes a toggle switch to turn the heater on and off, a thermostat to control the desired operating temperature and an over-temperature device to protect the heating elements from, overheating. A green pilot light indicates when the sink heater is in operation. A dial temperature indicator indicates that the water has reached sanitizing temperature. A red pilot light indicates the over-temperature thermostat has operated to disconnect power to the heating element[s].

#### **DAMAGED GOODS PROCEDURE:**

All damaged freight must be accepted by consignee. Any visible damage to carton or packaging must be noted on freight company's bill of lading before signing for freight. After accepting freight, consignee should request an inspection by the delivering carrier and request that a claim be filed. After the inspection is complete, freight may be returned to shipper for repairs or replacement. In the event of concealed damage, consignee should notify delivering carrier immediately.

|  |                                    |   |   |  |  |  |  |  |  |
|--|------------------------------------|---|---|--|--|--|--|--|--|
| <div style="display: flex; justify-content: space-between; align-items: center;"> <span>6.375</span> </div> <div style="border: 1px solid black; padding: 5px; text-align: center; font-weight: bold; font-size: 1.2em;">HATCO WATER HEATER</div> <div style="margin-top: 10px;"> <p><b>OPERATING INSTRUCTIONS</b></p> <ol style="list-style-type: none"> <li>1. FILL SINK WITHIN 2" (50.8MM) OF TOP WITH 140°F (60°C) WATER. FOR SHIPBOARD USE, FILL WITHIN 4" (101.6MM) OF TOP.</li> <li>2. TURN POWER ON TO HEATER.</li> <li>3. WHEN WATER TEMPERATURE REACHES 180°F (82°C), IMMERSE DISHES FOR 1 MINUTE TO SANITIZE.</li> <li>4. TURN POWER OFF BEFORE DRAINING, DRAIN HEATER DAILY.</li> </ol> <p><b>CLEANING INSTRUCTIONS</b></p> <ol style="list-style-type: none"> <li>5. PLACE ONE TABLESPOON OF STERA-SHEEN® OR EQUAL CLEANER IN INLET AND OUTLET FITTINGS. ALLOW TO STAND FOR ONE HOUR.</li> <li>6. DRAIN AND FLUSH WITH CLEAR WATER, USING WATER HOSE (FITTED WITH ADAPTER) IN OUTLET, AND THEN IN INLET.</li> </ol> <div style="display: flex; justify-content: space-around; align-items: center; margin-top: 20px;"> <div style="text-align: center;">  <p>LOW WATER<br/>REFILL AND<br/>RESET</p> </div> <div style="text-align: center;">  <p>POWER ON</p> </div> </div> <div style="text-align: center; margin-top: 10px;">  </div> <div style="text-align: center; font-weight: bold; font-size: 1.1em; margin-top: 10px;">WARNING 180°F (82°C) WATER TEMPERATURE</div> </div> |                                    | <div style="display: flex; flex-direction: column; align-items: center;"> <span>Ø.531<br/>(2)</span> <span>5.188</span> <span>1.875</span> </div> |   |  |  |  |  |  |  |
| <div style="display: flex; justify-content: space-between; align-items: center;"> <span>1.438</span> <span>3.500</span> </div> <p style="margin-top: 20px;">MATERIAL: .015" CLEAR POLYCARBONATE<br/>WITH 3M SCOTCH 467 HI-PERFORMANCE<br/>ADHESIVE OR EQUIVILANT APPROVED BY HATCO.<br/>PRINTED BLACK, METALIC SILVER, RED AND<br/>PROTECTO MATTE, REFER TO HATCO SALES AND<br/>MARKETING DEPT. FOR ORIGINAL ARTWORK.</p> <p style="text-align: right; margin-top: 10px;">PN.07-01-031</p> <p style="text-align: center; font-size: 0.8em;">THIS PRINT IS NOT TO BE REPRODUCED WITHOUT PERMISSION OF THE HATCO CORP.</p>   |                                    |   |   |  |  |  |  |  |  |
| SUPERCEDES<br>HC2-475<br>CHANGED<br>MAT. NOTES<br>ECO.#1268<br>4-29-86<br>REV.1: REDESIGNED<br>ECO.#2184, 5-10-88<br>REV.1: CHANGED  | TITLE BLOCK<br>ECO.#2633, 10-25-89 | INSTRUCTION & WARNING<br>PLATE<br>① FOR MODEL 3CS (M)<br>SINK HEATER-PER<br>MIL-H-43895B,<br>AMENDMENT 1  | HATCO CORP., MILWAUKEE, WIS.<br>DRAWN M.J.F. DATE 4-29-86<br>CHECKED _____ SCALE 12" = 12"<br>FILES <table border="1" style="display: inline-table; border-collapse: collapse; text-align: center;"> <tr> <td style="width: 20px; height: 15px;"></td> <td style="width: 20px; height: 15px;"></td> <td style="width: 20px; height: 15px;"></td> <td style="width: 20px; height: 15px;"></td> <td style="width: 20px; height: 15px;"></td> <td style="width: 20px; height: 15px;"></td> </tr> </table> <div style="border: 1px solid black; padding: 5px; font-weight: bold; font-size: 1.1em; margin-top: 5px;">HS1-1094-2</div> |  |  |  |  |  |  |
|  |                                    |   |   |  |  |  |  |  |  |

INSTRUCTION & WARNING PLATE FOR MODEL 3CS (M) SINK HEATER-PER MIL-H-43895B,  
AMENDMENT 1





## CHAPTER 3

### INSTRUCTIONS FOR INSTALLATION AND OPERATION OF THE HATCO 3CS HEATER

#### PLUMBING

1. A paper template with adhesive backing is shipped with the heater. The template is used for locating the holes for the sink strainers on which the heater will be mounted.
2. Strip the adhesive from the template and stick the template to the bottom inside the tank, with the notation "Front Cover" against the front wall of the tank.
3. Using the centers marked on this template, center punch and drill two [2] 3/4" holes. These holes are pilot holes for cutting the large holes with Greenlee cutters.
4. Remove the template and cut the 2" diameter holes using the standard #AV1756 Greenlee\* cutter. If this cutter is not available, use standard Greenlee\* 1-1/2" conduit cutter #500-6978, which is slightly under 2" diameter; then file or ream the holes slightly to 2" diameter.
5. Install the male threaded sink strainer with the thin gasket between the strainer flange and the inside of the sink or tank wall and the thick gaskets on the bottom side of the sink or tank with the fiber washer between the thick gasket and the nut and tighten finger-tight.
6. Attach heater to the sink strainers with the gaskets in place in the union.
7. Tighten the unions on the 3CS heater securely.
8. Tighten the nuts securely on the sink strainers.
9. Fill the tank or sink with water and check for leaks.
10. A hose or pipe may be connected to the heater sump drain and run to an open sight drain. Check local plumbing code for proper installation. The sump drain should not be permanently connected to the sanitary drain system.

#### **CAUTION**

**Electrical - Be sure 3CS heater tank is filled with water before energizing the heating element.**

Install a fused disconnect or circuit breaker sized according to the [table](#). The wiring from either of these to the Hatco 3CS sink heater should be in accordance with local electrical requirements.

\*VENDOR: Greenlee  
Greenlee Tool/Textron  
4455 Boeing Drive  
Rockford, IL 61109

## Power Circuit Breaker Requirements

|   | 208 VOLTS  |             |                      |                            | 240 VOLTS  |             |                      |                            | 440 VOLTS  |             |                      |                            |
|---|------------|-------------|----------------------|----------------------------|------------|-------------|----------------------|----------------------------|------------|-------------|----------------------|----------------------------|
| <b>KW<br/>RTG.</b>  | <b>PH.</b> | <b>AMPS</b> | <b>WIRE<br/>SIZE</b> | <b>CIRCUIT<br/>BREAKER</b> | <b>PH.</b> | <b>AMPS</b> | <b>WIRE<br/>SIZE</b> | <b>CIRCUIT<br/>BREAKER</b> | <b>PH.</b> | <b>AMPS</b> | <b>WIRE<br/>SIZE</b> | <b>CIRCUIT<br/>BREAKER</b> |
| 3   | 1          | 14.5        | 12                   | 20                         | 1          | 12.5        | 12                   | 20                         | 1          | 6.8         | 14                   | 15                         |
| 3   | 3          | 8.3         | 14                   | 15                         | 3          | 7.2         | 14                   | 15                         | 3          | 3.9         | 14                   | 15                         |
| 4.5   | 1          | 22          | 10                   | 30                         | 1          | 19          | 10                   | 30                         | 1          | 10.2        | 14                   | 15                         |
| 4.5   | 3          | 12.5        | 12                   | 20                         | 3          | 10.8        | 14                   | 15                         | 3          | 5.9         | 14                   | 15                         |
| 6   | 1          | 29          | 8                    | 40                         | 1          | 25          | 10                   | 30                         | 1          | 13.6        | 12                   | 20                         |
| 6   | 3          | 18.8        | 10                   | 30                         | 3          | 14.4        | 12                   | 20                         | 3          | 7.8         | 14                   | 15                         |
| 9   | 1          | 43          | 4                    | 60                         | 1          | 38          | 6                    | 50                         | 1          | 20.4        | 10                   | 30                         |
| 9   | 3          | 25          | 10                   | 30                         | 3          | 22          | 10                   | 30                         | 3          | 11.8        | 14                   | 15                         |
| <p style="text-align: center;">NOTE</p> <p>Three Phase is Balanced.</p> |            |             |                      |                            |            |             |                      |                            |            |             |                      |                            |

**OPERATION [Reference - Wiring Diagram - Page ii]**

1. Fill the sink or tank to normal operating level.
2. Turn switch to "ON". The green light indicates power is "ON". An indicating dial thermometer indicates when sanitizing temperature is reached.\* When the sink or tank is drained through the sink drain, water remains in the 3CS heater.
3. When the toggle switch is turned on, 208, 240 or 440 volts power is applied to power relay coil "M" through the contacts of control thermostat and the N.C. contacts of the SPDT control relay. Power then is applied to the heating elements through the contacts of the DPST power relay. At the same time, the green "Power On" pilot light lights since it is wired across the line.

If the sink heater sump is drained as well as the sink itself, and the power is left on, or turned on before the sink is refilled, the small amount of water in the heating element chamber will heat quickly to the boiling point. At about 205° F., the high limit thermostat  $T_h$  will close. This energizes the SPDT relay "CR", causing the circuit to the power relay "M" to open, de-energizing the heating elements. Simultaneously, the red pilot light is turned "on", and the "CR" relay is latched "closed". This indicates to the operator that the heater has overheated, that power is off to the heating elements, and that the sink should be refilled. After the sink is refilled, power is restored by turning the toggle switch to "Off" to reset the SPDT relay, then to "On".

4.

**CAUTION**

**Turn switch to "OFF" when sink is drained. After sink is drained, the sediment sump should be drained by actuating the valve handle.**

**TO DRAIN HEATER SUMP**

Incorporated in the 3CS is a sediment sump. The purpose of this sump is to collect any soil flat the water circulating through the heater. This sump should be drained each time the sink or tank is drained. A two quart pan is large enough to collect all the water from this sump. Drain the sump by operating the valve handle at the left side of the 3CS heater.

**CAUTION**

**Shut off power to the heater before draining.**

**DRAINAGE PROVISION**

To drain the heater completely:

1. Turn off the electric supply to the heater.
2. Drain sink or tank.
3. Drain sump by turning the sump valve handle at left side of the 3CS heater.
4. Remove the pipe cap on the left side of the heater to drain the element compartment of the 3CS heater and

\*See Service Procedure for thermostat recalibration if operating temperature is not adequate.

drain into a suitable container. The 3CS heater is now completely drained so that the heater will be safe from freezing or so that the element [s] can be removed if replacement is necessary.

## **IMPORTANT**

To place the heater back in operation:

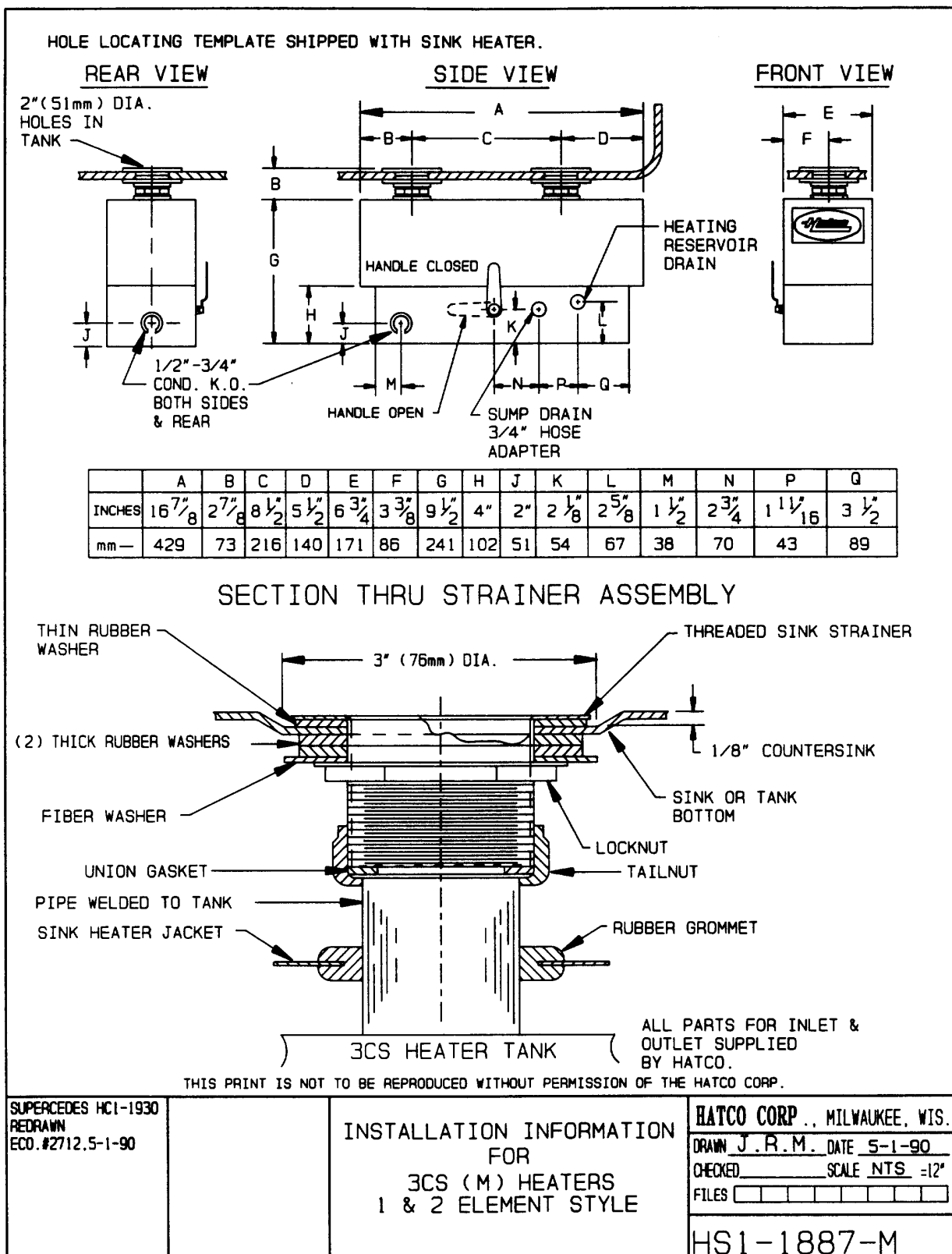
1. Replace small pipe cap.
2. Close sump valve.
3. Fill tank with water.
4. Turn on power.

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## **WARNING**

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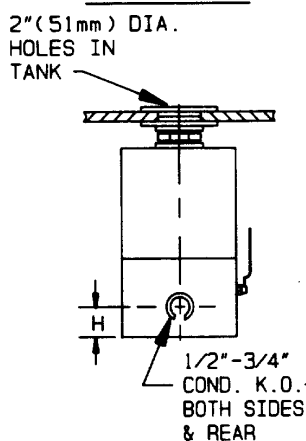
**Never service the 3CS heater without turning off the power at the fused disconnect switch or circuit breaker. High voltage is present.**



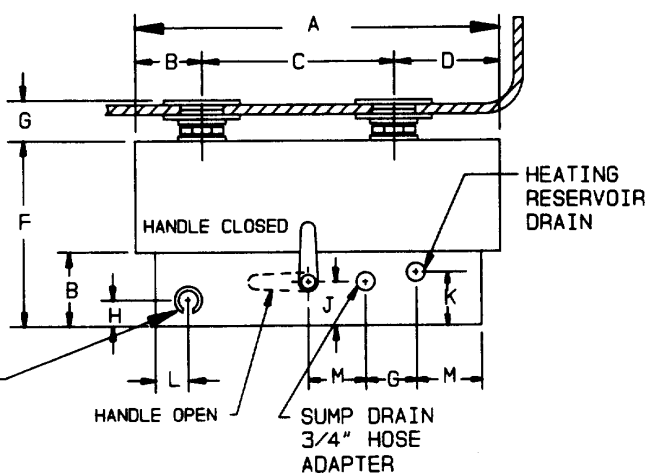
INSTALLATION INFORMATION FOR 3CS (M) HEATERS 1 &amp; 2 ELEMENT STYLE

HOLE LOCATING TEMPLATE SHIPPED WITH SINK HEATER.

## REAR VIEW



## SIDE VIEW

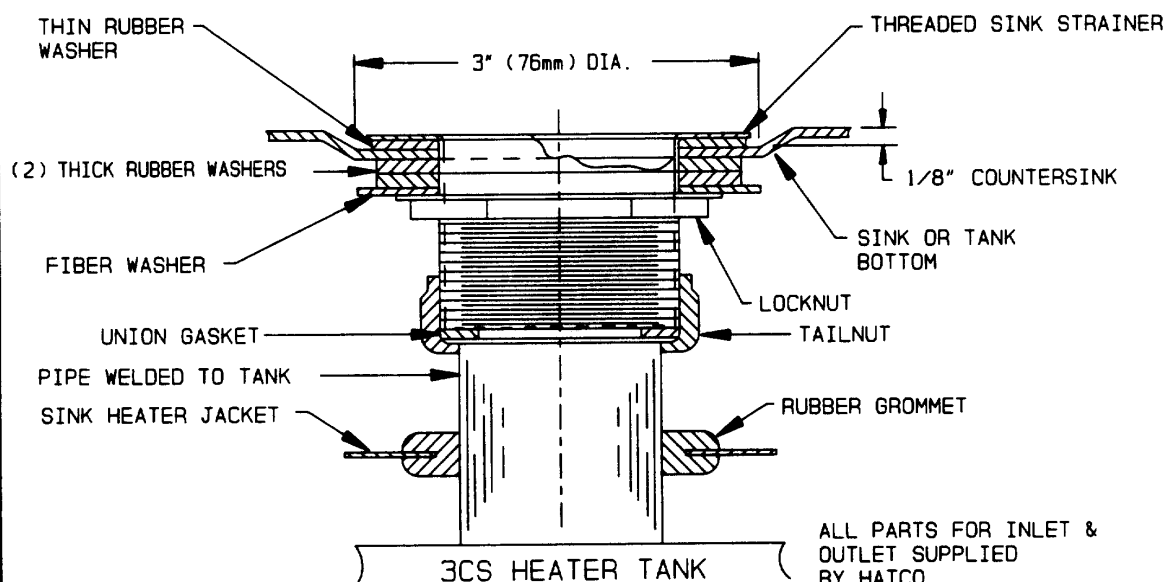


## FRONT VIEW



|        | A      | B   | C     | D     | E   | F     | G     | H  | J     | K     | L     | M     |
|--------|--------|-----|-------|-------|-----|-------|-------|----|-------|-------|-------|-------|
| INCHES | 17 1/8 | 4   | 8 1/2 | 4 5/8 | 8   | 9 3/4 | 2 7/8 | 2" | 2 1/4 | 2 1/2 | 1 1/2 | 2 3/4 |
| mm     | 435    | 102 | 216   | 117   | 203 | 248   | 73    | 51 | 57    | 63    | 38    | 70    |

## SECTION THRU STRAINER ASSEMBLY



ALL PARTS FOR INLET & OUTLET SUPPLIED BY HATCO.

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ECO.#2712

### INSTALLATION INFORMATION FOR 3CS (M) HEATERS 3 ELEMENT STYLE

HATCO CORP., MILWAUKEE, WIS.

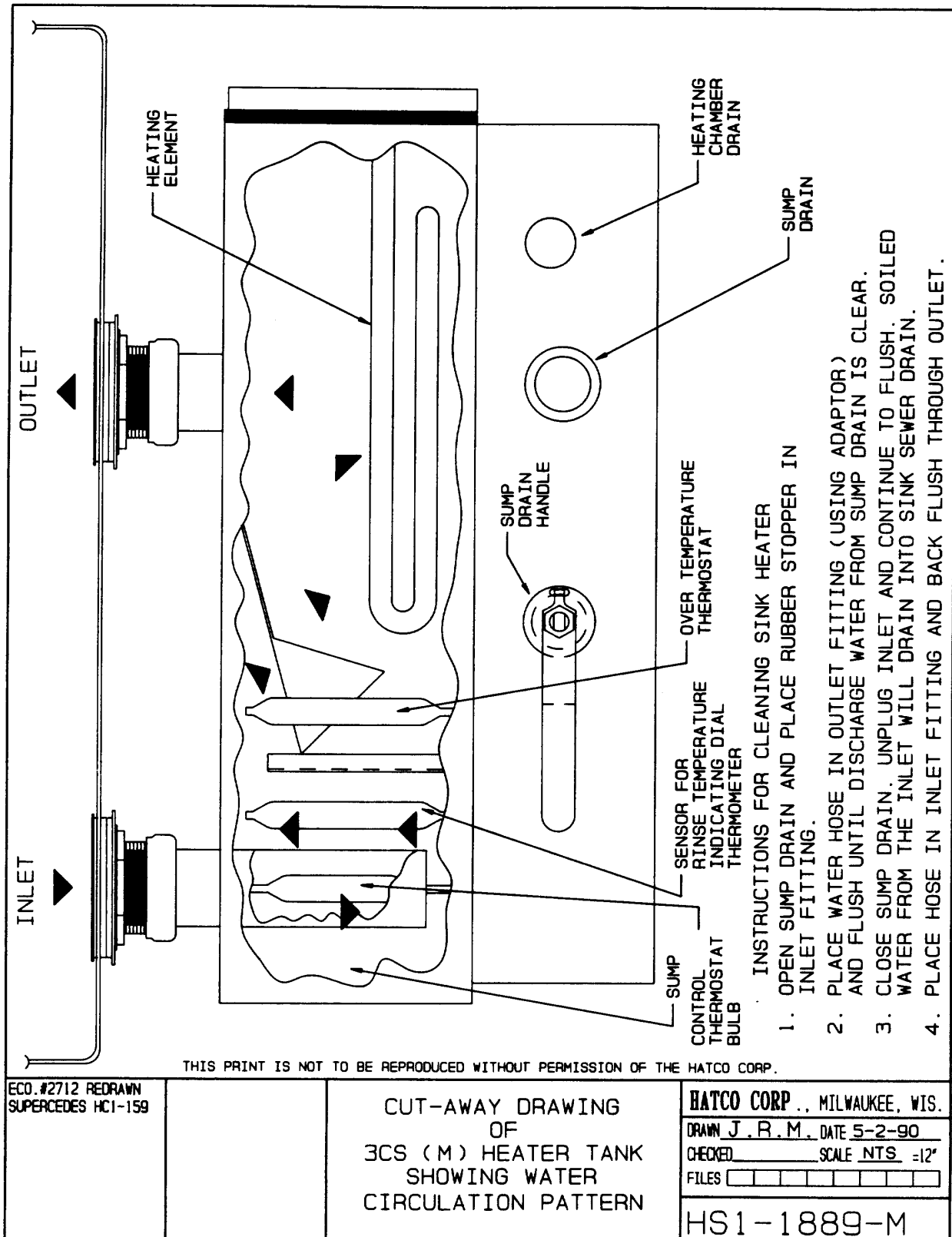
DRAWN J.R.M. DATE 5-1-90

CHECKED \_\_\_\_\_ SCALE NTS. = 1/2"

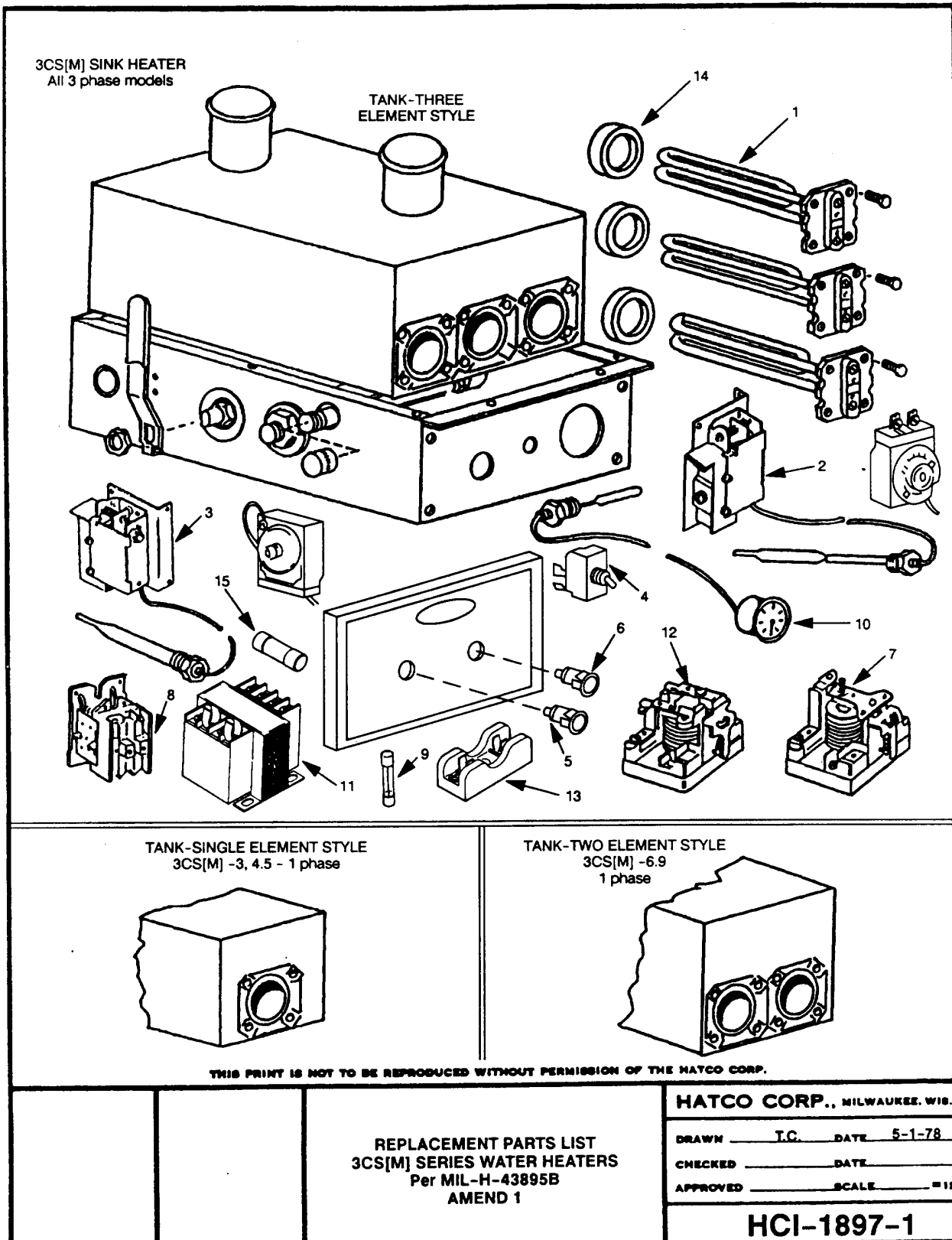
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HS1-1885-M

INSTALLATION INFORMATION FOR 3CS (M) HEATERS 3 ELEMENT STYLE



CUT-AWAY DRAWING OF 3CS (M) HEATER TANK SHOWING WATER CIRCULATION PATTERN





## REPLACEMENT PARTS LIST FOR 3CS [M] HEATING ELEMENTS

| FIG. ITEM | PART NUM-<br>BER       | QTY. | DESCRIPTION                | NOTES          |                  |
|-----------|------------------------|------|----------------------------|----------------|------------------|
|           |                        |      |                            | MODEL          | APPLICA-<br>TION |
| 1         | 02-06-300 <sup>1</sup> | 1    | Heating Element 3000W 208V | 3CS [M]-3      | 208V-1Ph.        |
|           | 02-06-301 <sup>2</sup> | 1    | Heating Element 3000W 240V | 3CS [M]-3      | 240V-1Ph.        |
|           | 02-06-302 <sup>3</sup> | 1    | Heating Element 3000W 440V | 3CS [M]-3      | 440V-1Ph.        |
|           | 02-06-450 <sup>4</sup> | 1    | Heating Element 4500W 208V | 3CS [M]-4      | 208V-1Ph.        |
|           | 02-06-451 <sup>5</sup> | 1    | Heating Element 4500W 240V | 3CS [M]-4      | 240V-1Ph.        |
|           | 02-06-452 <sup>6</sup> | 1    | Heating Element 4500W 480V | 3CS [M]-4      | 440V-1Ph.        |
|           | 02-06-300 <sup>1</sup> | 3    | Heating Element 3000W 208V | 3CS [M]-3 Bal. | 208V-3Ph.        |
|           | 02-06-301 <sup>2</sup> | 3    | Heating Element 3000W 240V | 3CS [M]-3 Bal. | 240V-3Ph.        |
|           | 02-06-302 <sup>3</sup> | 3    | Heating Element 3000W 440V | 3CS [M]-3 Bal. | 440V-3Ph.        |
|           | 02-06-450 <sup>4</sup> | 3    | Heating Element 4500W 208V | 3CS [M]-4 Bal. | 208V-3Ph.        |
|           | 02-06-451 <sup>5</sup> | 3    | Heating Element 4500W 240V | 3CS [M]-4 Bal. | 240V-3Ph.        |
|           | 02-06-452 <sup>6</sup> | 3    | Heating Element 4500W 480V | 3CS [M]-4 Bal. | 440V-3Ph.        |
|           | 02-06-300 <sup>1</sup> | 2    | Heating Element 3000W 208V | 3CS [M]-6      | 208V-1Ph.        |
|           | 02-06-301 <sup>2</sup> | 2    | Heating Element 3000W 240V | 3CS [M]-6      | 240V-1Ph.        |
|           | 02-06-302 <sup>3</sup> | 2    | Heating Element 3000W 440V | 3CS [M]-6      | 440V-1Ph.        |
|           | 02-06-450 <sup>4</sup> | 2    | Heating Element 4500W 208V | 3CS [M]-9      | 208V-1Ph.        |
|           | 02-06-451 <sup>5</sup> | 2    | Heating Element 4500W 240V | 3CS [M]-9      | 240V-1Ph.        |
|           | 02-06-452 <sup>6</sup> | 2    | Heating Element 4500W 480V | 3CS [M]-9      | 440V-1Ph.        |
|           | 02-06-301 <sup>2</sup> | 3    | Heating Element 3000W 240V | 3CS [M]-6 Bal. | 208V-3Ph.        |
|           | 02-06-450 <sup>4</sup> | 3    | Heating Element 4500W 208V | 3CS [M]-6 Bal. | 240V-3Ph.        |
|           | 02-06-603 <sup>7</sup> | 3    | Heating Element 2000W 277V | 3CS [M]-6 Bal. | 440V-3Ph.        |
|           | 02-06-300 <sup>1</sup> | 3    | Heating Element 3000W 208V | 3CS [M]-9 Bal. | 208V-3Ph.        |
|           | 02-06-301 <sup>2</sup> | 3    | Heating Element 3000W 240V | 3CS [M]-9 Bal. | 240V-3Ph.        |
|           | 02-06-302 <sup>3</sup> | 3    | Heating Element 3000W 440V | 3CS [M]-9 Bal. | 440V-3Ph.        |

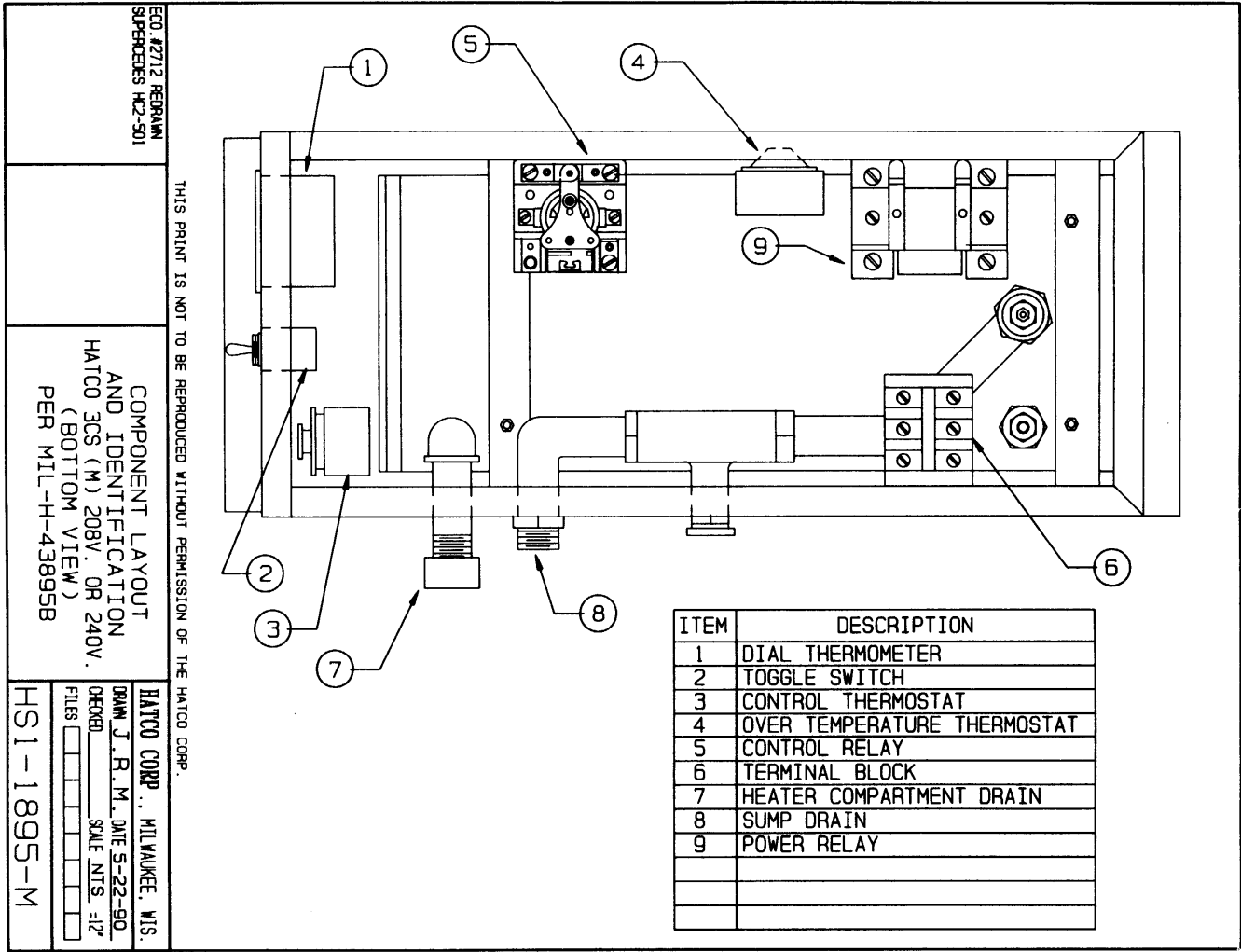
<sup>1</sup>Chromalox Part #155-055881-001<sup>2</sup>Chromalox Part #155-055881-002<sup>3</sup>Chromalox Part #155-055881-003<sup>4</sup>Chromalox Part #155-055881-004<sup>5</sup>Chromalox Part #155-055881-005<sup>6</sup>Chromalox Part #155-055881-006<sup>7</sup>Chromalox Part #155-055881-007

## REPLACEMENT PARTS LIST FOR 3CS [M] (Continued)

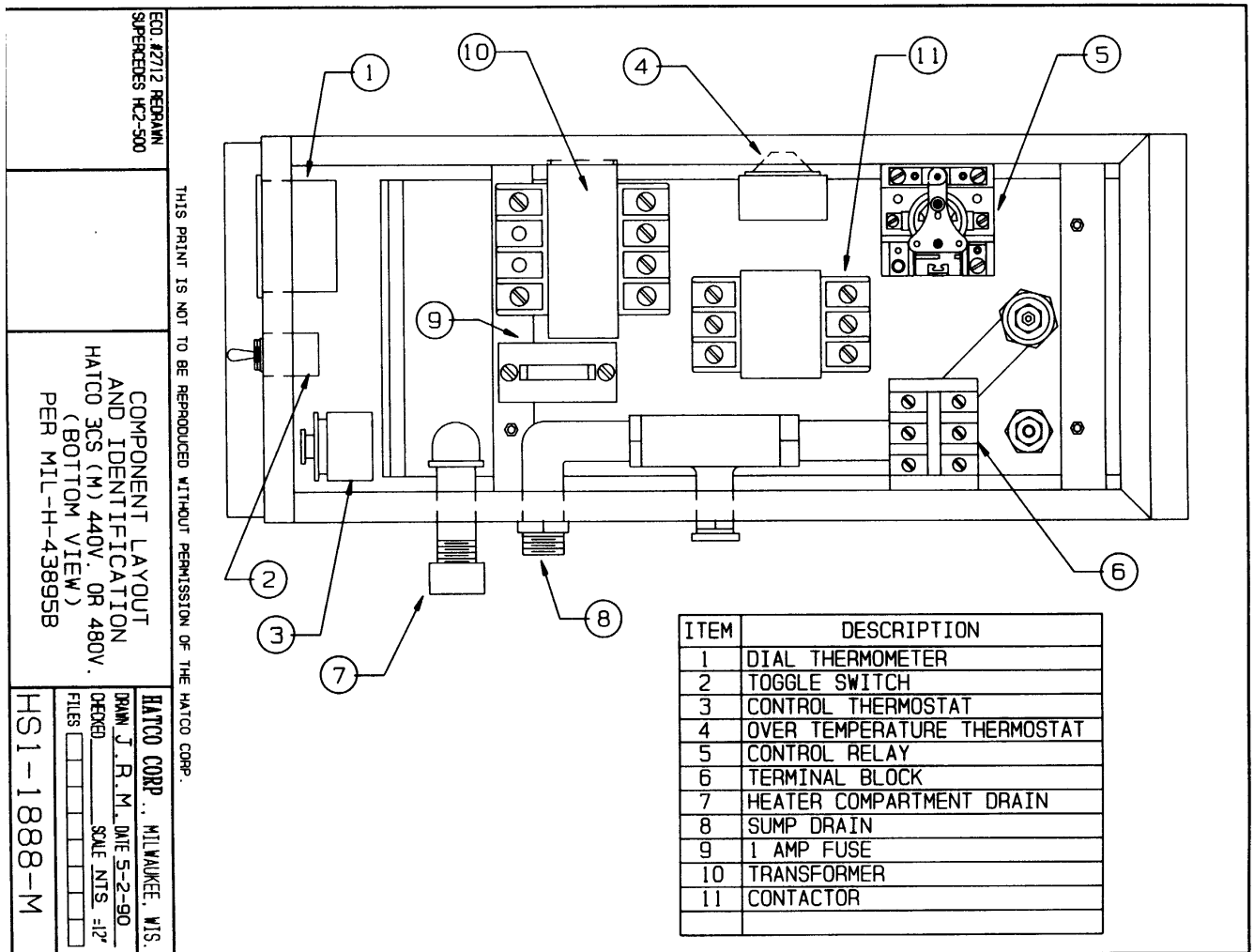
| FIG. ITEM # | PART #    | QTY. | DESCRIPTION  | VENDOR  |
|-------------|-----------|------|--|---|
| 2           | 02-16-003 | 1    | Control Thermostat All Models                        | Robertshaw Controls Co.<br>Indiana, PA 15701<br>Part No. KX168-18<br>or United Tech.-Hamilton Std.<br>Contr.<br>P.O. Box 3297<br>Lexington, OH 44904<br>Part No. 351-253978 |
| 3           | 02-16-004 | 1    | Over Temperature Thermostat All Models               | Robertshaw Controls Co. (See Item. 2)<br>Part No. SR2-12<br>or United Technologies (See Item. 2)<br>Part No. 351-253954   |
| 4           | 02-19-008 | 1    | Toggle Switch All Models                             | Eaton Corp.-Cutler Hanver Prod.<br>4201 North 27th Street<br>Milwaukee, WI 53216<br>Part No. 8931K400   |
| 5           | 02-19-151 | 1    | Red Indicating Light 250V All Models                 | Jemco Engineering Co.<br>400 East Wapella St.<br>Minocka, IL 60447<br>Part No. XL-8220-5JKL   |
| 6           | 02-19-150 | 1    | Green [Power On] Light 250V All Models               | Jemco Engineering Co. (See Item. 5)<br>Part No. XL-8226-5JKL  |
| 7           | 02-01-007 | 1    | 30 Amp - 240V Coil Control Relay SPDT All Models     | Deltrol Corp.-Deltrol Controls<br>2745 South 19th Street<br>Milwaukee, WI 53215<br>Part No. 20239-84  |
| 8           | 02-01-013 | 1    | Contactor - 30 Amp - Pole All 3 Phase Models         | Furnas Electric Co.<br>1000 McKee Street<br>Batavia, IL 60510<br>Part No. 41NB 30 AG  |
| 9           | 02-03-001 | 1    | Fuse-AGC 1 Amp 440 Volts Models Only                 | Cooper Ind. - Bussmarnn<br>P.O. Box 14460<br>St. Louis, MO 63178<br>Part No. AGC-1  |
| 10          | 03-01-005 | 1    | Dial Thermometer All Models                          | Weiss Instruments<br>85 Bell Street<br>W. Babylon, NY 11704<br>Part No. 20UB3-41X1  |
| 11          | 02-17-002 | 1    | Transformer 460/230V 440 Volts Models Only           | Micron Industries<br>1830 32 Avenue<br>Stone Park, IL 60165<br>Part No. B050TX18-XK   |
| 12          | 02-01-008 | 1    | 30 Amp-230V Coil-Power Relay 208/240V-1 Phase Models | Deltrol Corporation (See Item. 7)<br>Part No. 26119-60  |
| 13          | 02-03-003 | 1    | Fuse Block for #9 Above 440 Volts Models Only        | Cooper Ind. - Bussmann (See Item. 9)<br>Part No. 4396   |

## REPLACEMENT PARTS LIST FOR 3CS [M] (Continued) - Continued

| <b>FIG. ITEM #</b> | <b>PART #</b> | <b>QTY.</b> | <b>DESCRIPTION</b>                                 | <b>VENDOR</b>   |
|--------------------|---------------|-------------|--|---|
| 14                 | 05-06-005     | 1, 2, 3     | Element Gasket All Models                          | N.L. Kuehn Co.<br>3747 North Booth St.<br>Milwaukee, WI 53212<br>Part No. HS1-1832  |
| 15                 | 02-03-005     | 1           | SC 1/2 Fuse for #11 Above 440<br>Volts Models Only | Cooper Ind. - Bussmann (See<br>Item. 9)<br>Part No. SC 1/2<br>or Littelfuse<br>800 E. Northwest Hwy.<br>Des Plaines, IL 60016<br>Part No. SLC 1/2 |



COMPONENT LAYOUT AND IDENTIFICATION HATCO 3CS (M) 208V. OR 240V. (BOTTOM VIEW)  
PER MIL-H-43895B



COMPONENT LAYOUT AND IDENTIFICATION HATCO 3CS (M) 440V. OR 480V. (BOTTOM VIEW)  
PER MIL-H-43895B



**CHAPTER 4****SERVICE PROCEDURES 3CS [M] CHECK LIST**

- A. Unit does not heat, pilot light off:
  - 1. Check for proper voltage at terminal block.
  - 2. If circuit breaker keeps tripping, check for short circuit and correct breaker size.
  - 3. Check high limit for continuity.
  - 4. Check on/off switch for continuity.
- B. Unit does not heat, pilot light on:
  - 1. Check element(s) for continuity.
  - 2. Check for proper voltage at element(s).
  - 3. Check thermostat for continuity.
  - 4. Check high limit for continuity.
  - 5. Check relay for proper operation.
  - 6. Check on/off switch for continuity.
- C. Unit heats but does not reach 180° F.:
  - 1. Control thermostat out of calibration. Recalibrate thermostat per instructions. Remove front spec plate and bottom cover for access to thermostat.
  - 2. Check high limit for proper calibration.
- D. Unit overheats and causes unit to trip high limit:
  - 1. Check control thermostat for proper calibration.
  - 2. Replace thermostat if unit still overheats after recalibration.
  - 3. Check to see if unit has been cleaned so that there is proper circulation.
  - 4. Check high limit for proper calibration.

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**WARNING**

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**Never service the 3CS[M] heater without turning off the power at the fused disconnect switch or circuit breaker. High voltage is present.**



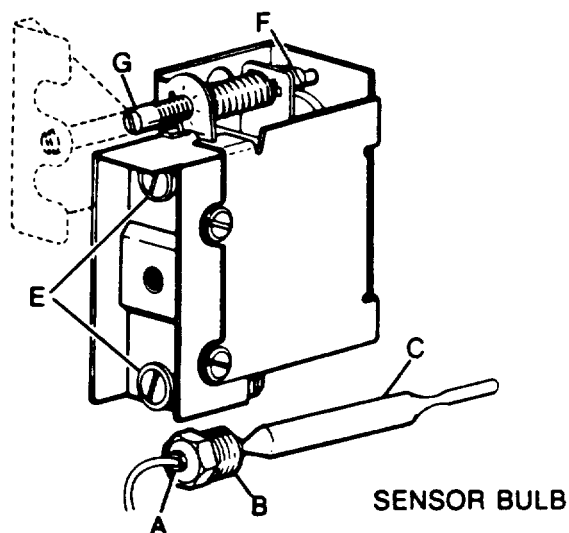


## CHAPTER 5

### INSTALLATION AND RECALIBRATION OF THERMOSTATS

#### THERMOSTAT ADJUSTMENT

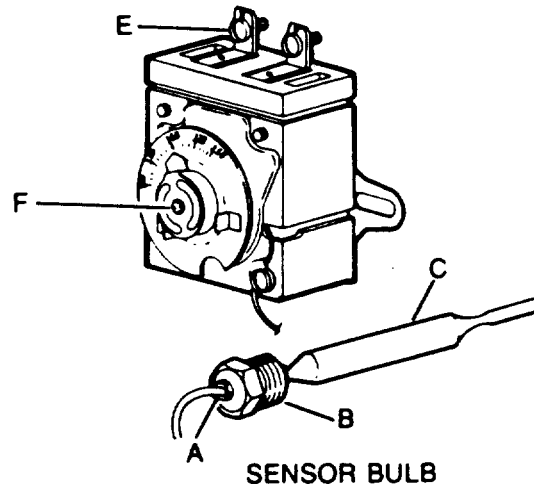
The thermostats are factory calibrated to produce 185-190°F. temperatures. If recalibration is necessary, turn screw (G) counterclockwise to lower the set point or turn the adjustment nut (F) counterclockwise to raise the set point (must hold screw (G) at high stop). NOTE One-sixth of a turn equals 12 degrees.



Thermostat Adjustment

#### RECALIBRATION

These thermostats are checked and accurately set at our factory. If recalibration is necessary, a 1/4 turn clockwise of screw "F" will decrease the temperature 12°F.



---

### Thermostat Recalibration

#### TO REMOVE THERMOSTAT:

1. Shut off power and drain tank; remove leads from thermostat terminals "E".
2. Loosen nut "A", then remove bushing "B" from tank. Thermostat with bracket and sensor bulb "C" can now be removed from tank.

#### TO INSTALL THERMOSTAT

1. Pull end of sensor bulb "C" into recess in bushing "B".
2. Insert bushing "B" and sensor bulb into tank; holding sensor bulb in place with capillary tube, tighten bushing "B".
3. Lock sensor bulb and capillary tube in place by tightening nut "A".

#### CAUTION

**DO NOT OVERTIGHTEN NUT OR SLEEVE INSIDE OF BUSHING  
WILL CUT THROUGH TUBING.**

4. Replace thermostat on bracket. Replace leads on thermostat terminals "E".

#### CAUTION

**BE SURE TANK IS REFILLED BEFORE TURNING ON POWER.**

## CHAPTER 6

### LIMITED WARRANTY

Hatco manufactured equipment is guaranteed to be free from defects in material and workmanship, under normal use and service, and when installed in accordance with factory recommendations.

The manufacturer's obligation under this warranty shall be to repair or replace at its option, any part deemed defective upon examination, for a period of one year from date of installation, and shall pay the labor to repair or replace said part for the first 90 days of this warranty and installation date must be established by return of the WARRANTY REGISTRATION card or other means, to the manufacturer's satisfaction. Service is to be performed by authorized service agencies, during normal working hours.

The owner shall pay all shipping charges including the return of defective parts for examination and credit.

Accessory components, not installed by factory, carry a one year parts replacement warranty. Labor to replace is not included.

Item not covered by warranty: Failures due to liming or sediment buildup in tank and calibration of thermostats or high limit switches following installation and acceptance.

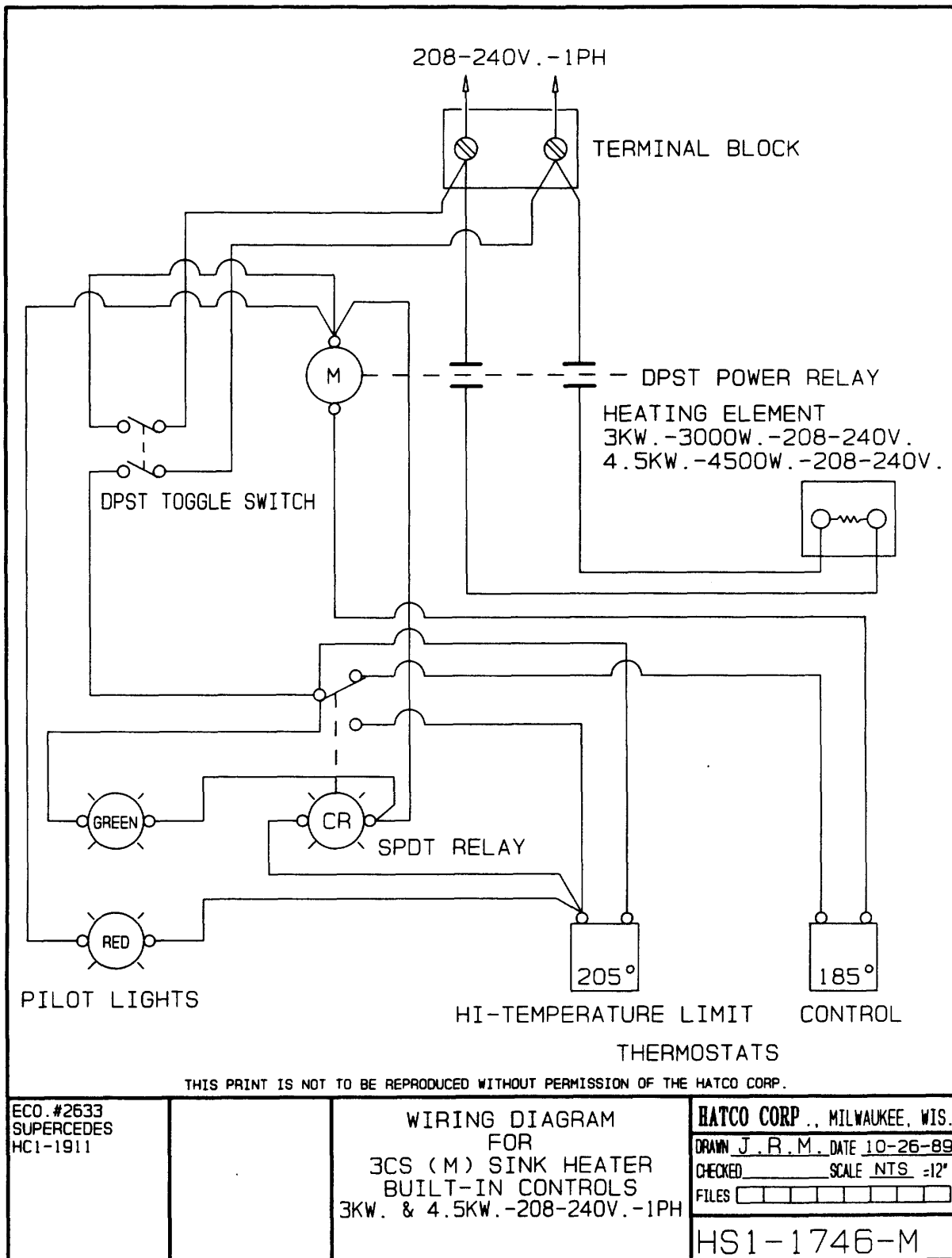
This warranty is void in the event of misuses tampering, misapplication, or if incorrect voltage is applied.

This warranty is in lieu of all other warranties either expressed or implied, and is authorized by the responsibility of the Hatco Corporation.

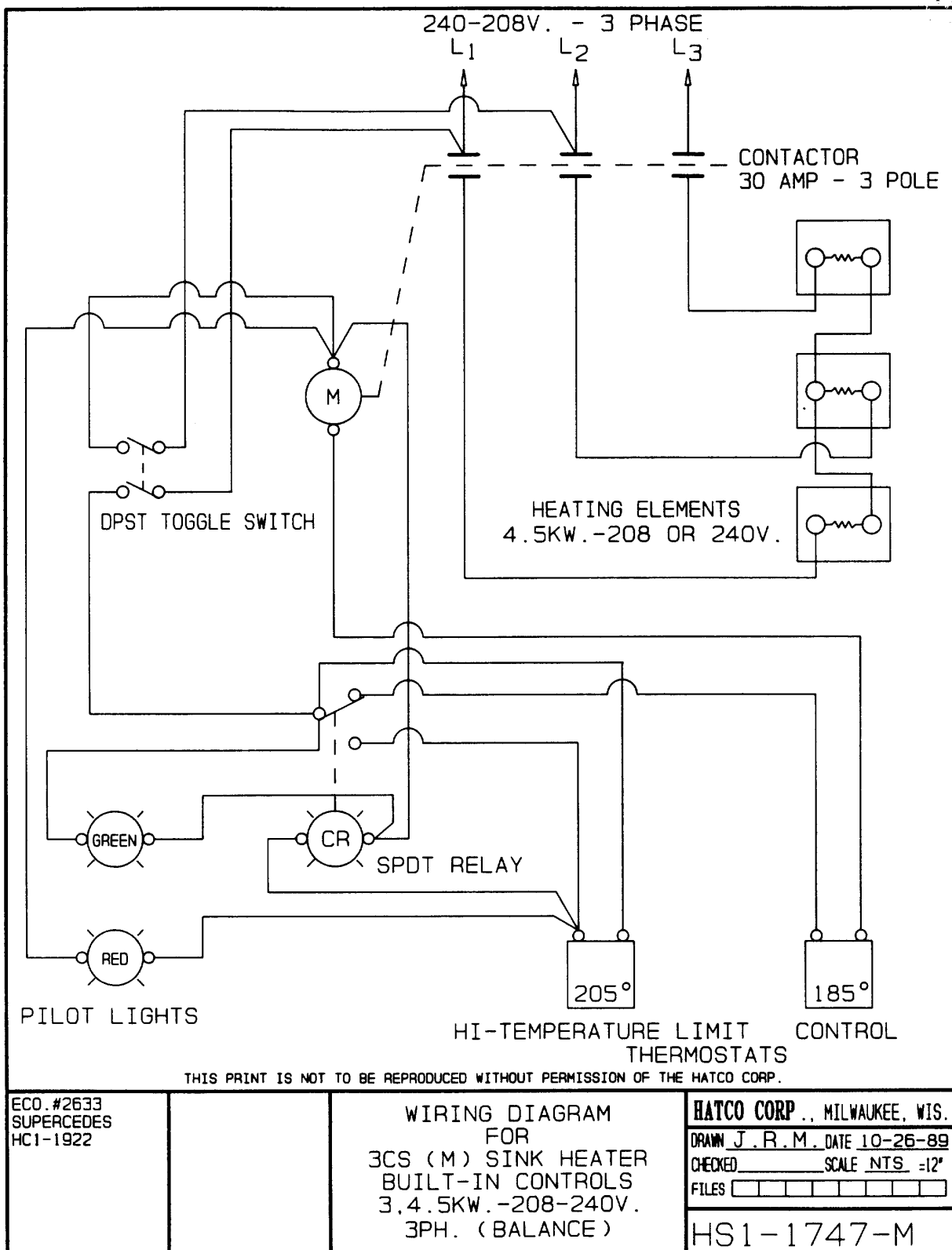
UNITED STATES AND CANADA ONLY ELSEWHERE - PARTS ONLY



**CHAPTER 7**  
**WIRING DIAGRAMS**



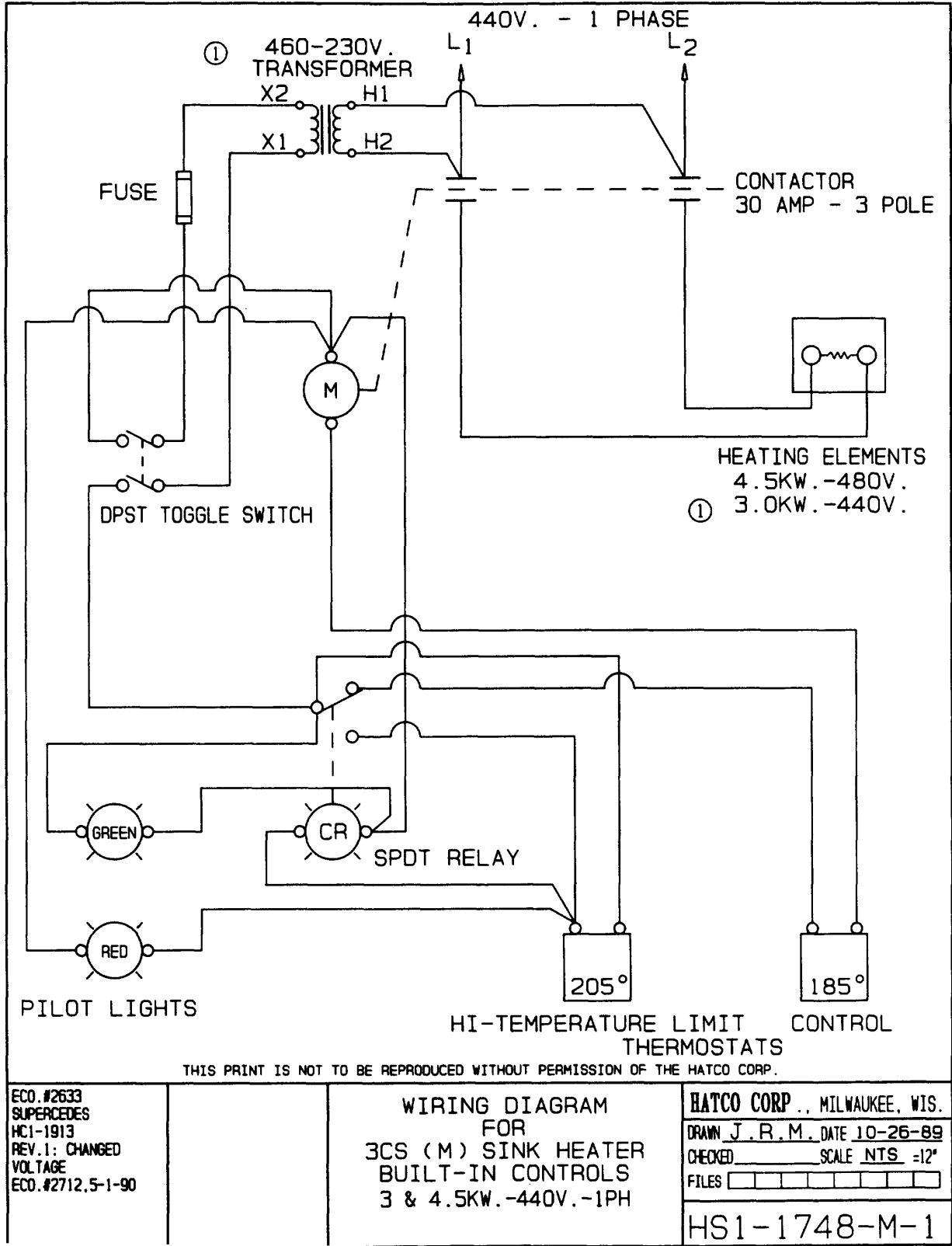
HS1-1746-M WIRING DIAGRAM FOR 3CS (M) SINK HEATER BUILT-IN CONTROLS 3KW. & 4.5KW.  
-208-240V. - 1PH



HS1-1747-M WIRING DIAGRAM FOR 3CS (M) SINK HEATER BUILT-IN CONTROLS 3,4.5KW. -208-240V. - 3PH (BALANCE)

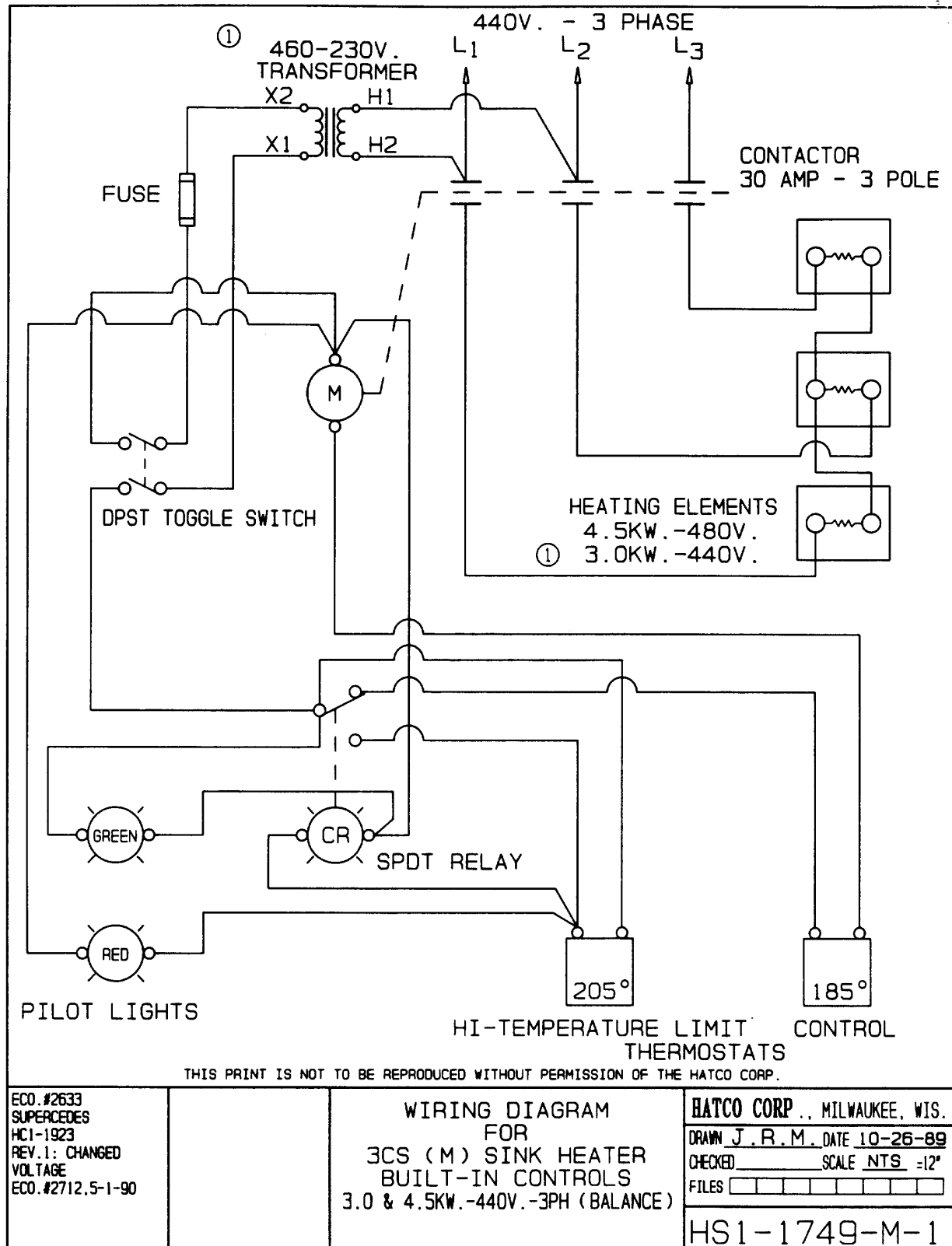




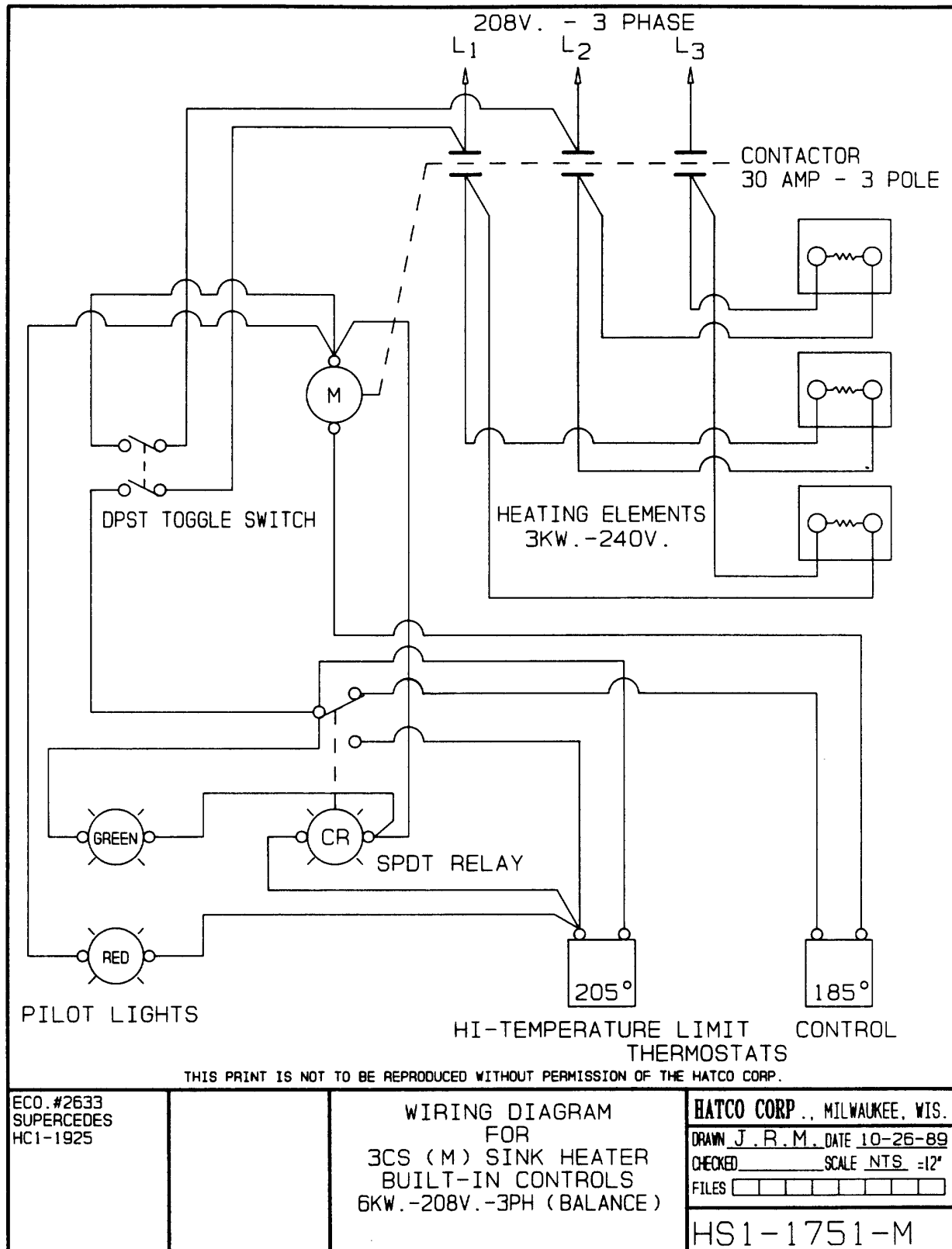


HS1-1748-M-1 WIRING DIAGRAM FOR 3CS (M) SINK HEATER BUILT-IN CONTROLS 3 & 4.5KW. -440V. - 1PH

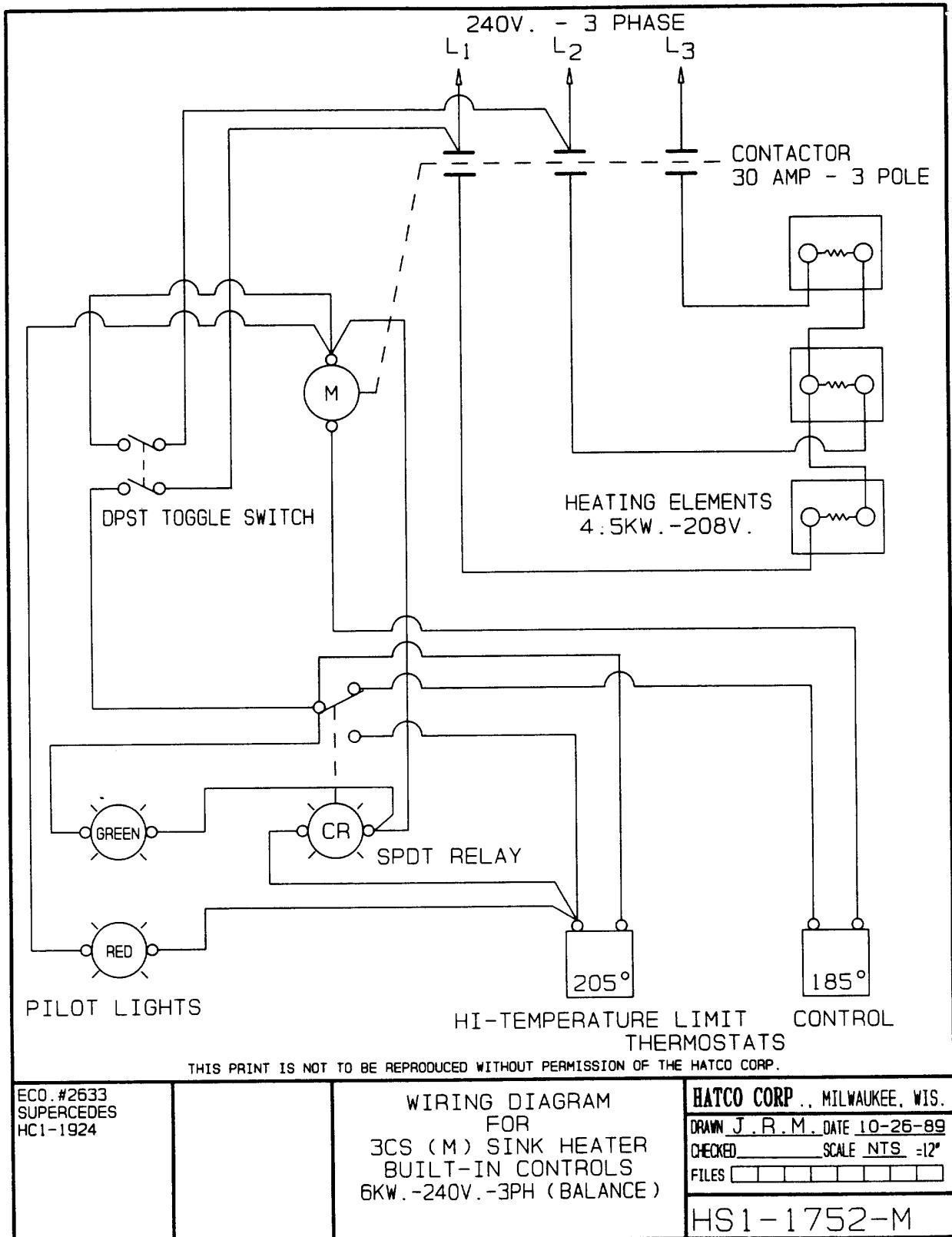




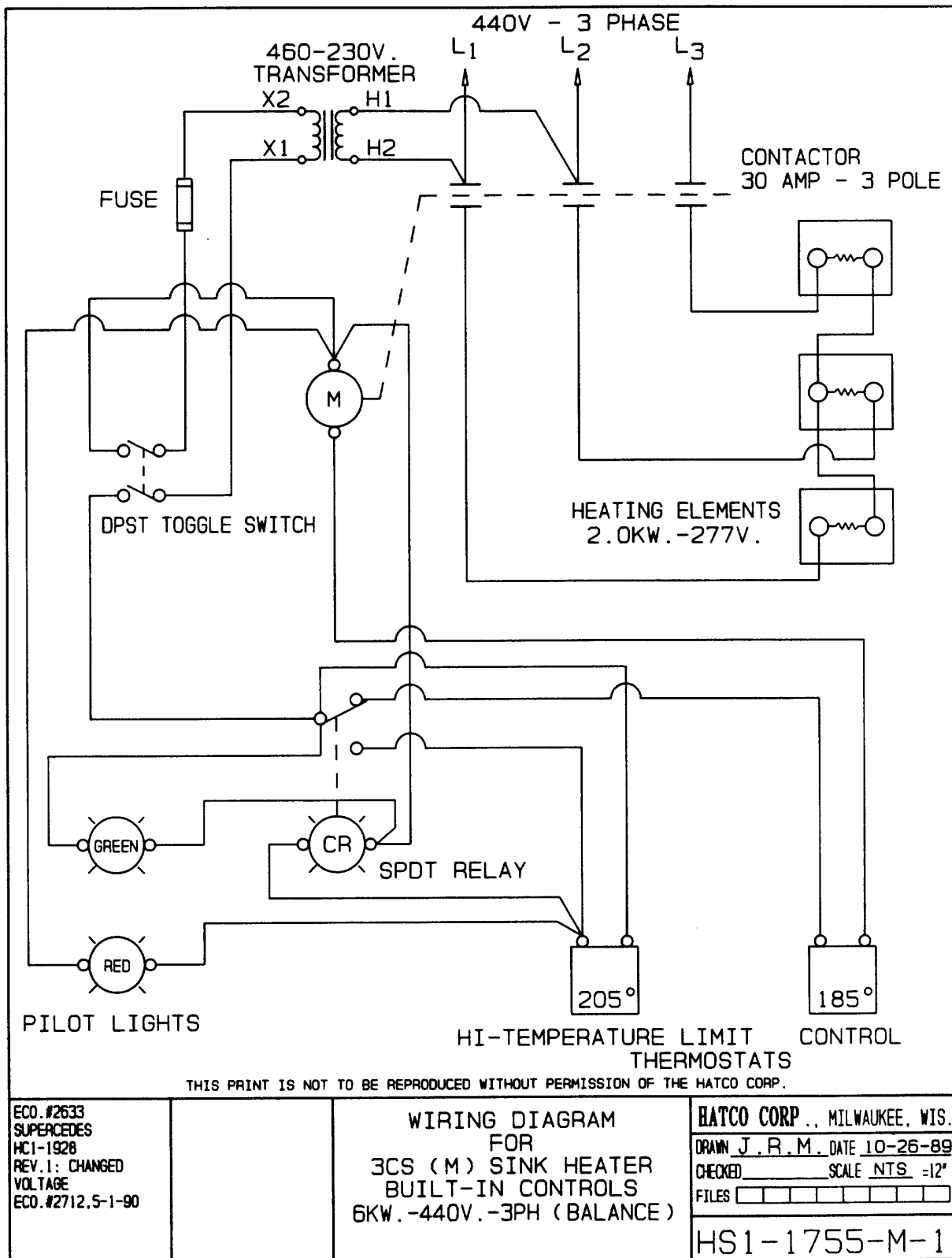
HS1-1749-M-1 WIRING DIAGRAM FOR 3CS (M) SINK HEATER BUILT-IN CONTROLS 3.0. & 4.5KW.  
-440V. - 3PH (BALANCE)



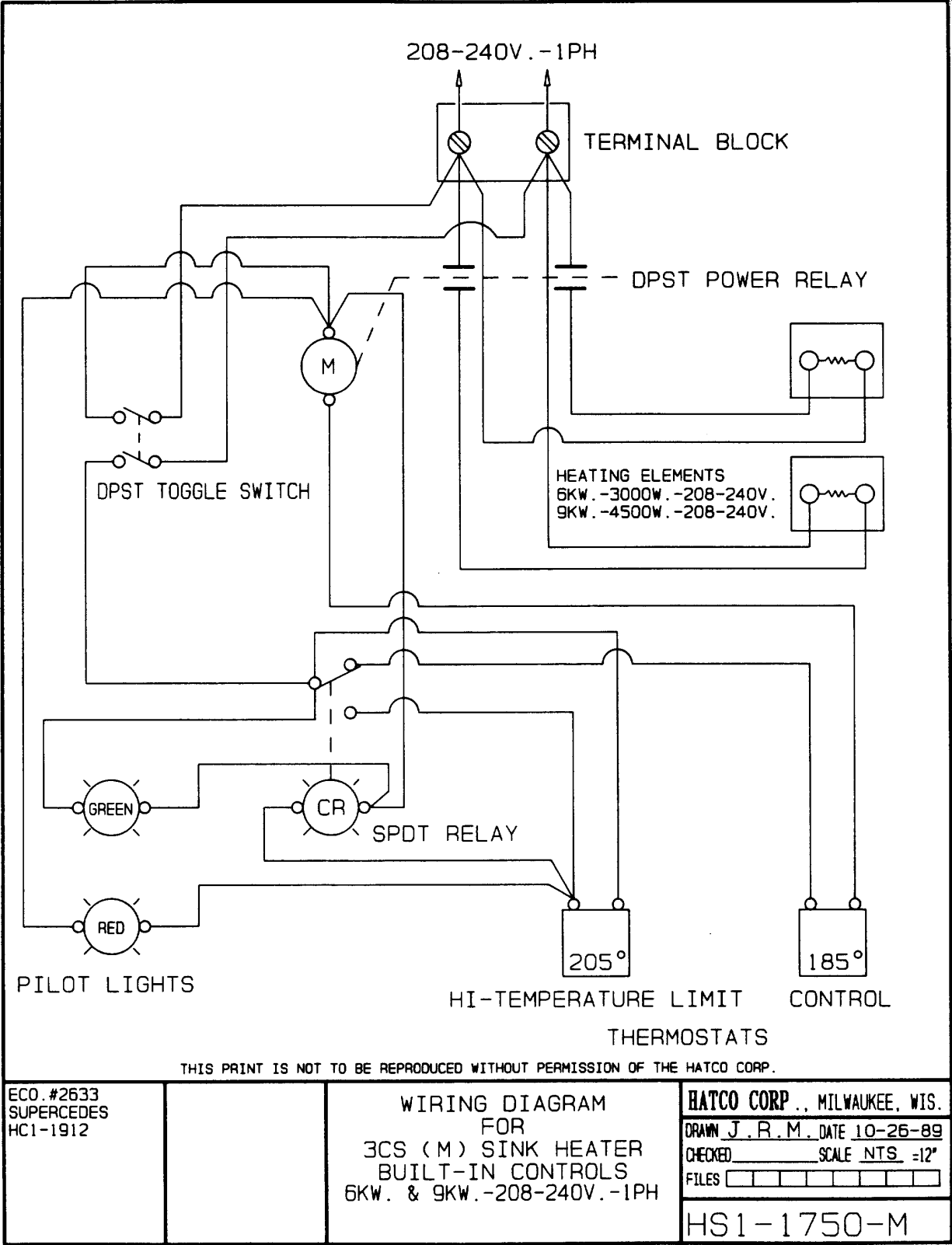
HS1-1751-M WIRING DIAGRAM FOR 3CS (M) SINK HEATER BUILT-IN CONTROLS 6KW. - 208V. - 3PH (BALANCE)



HS1-1752-M WIRING DIAGRAM FOR 3CS (M) SINK HEATER BUILT-IN CONTROLS 6KW. -240V. - 3PH (BALANCE)



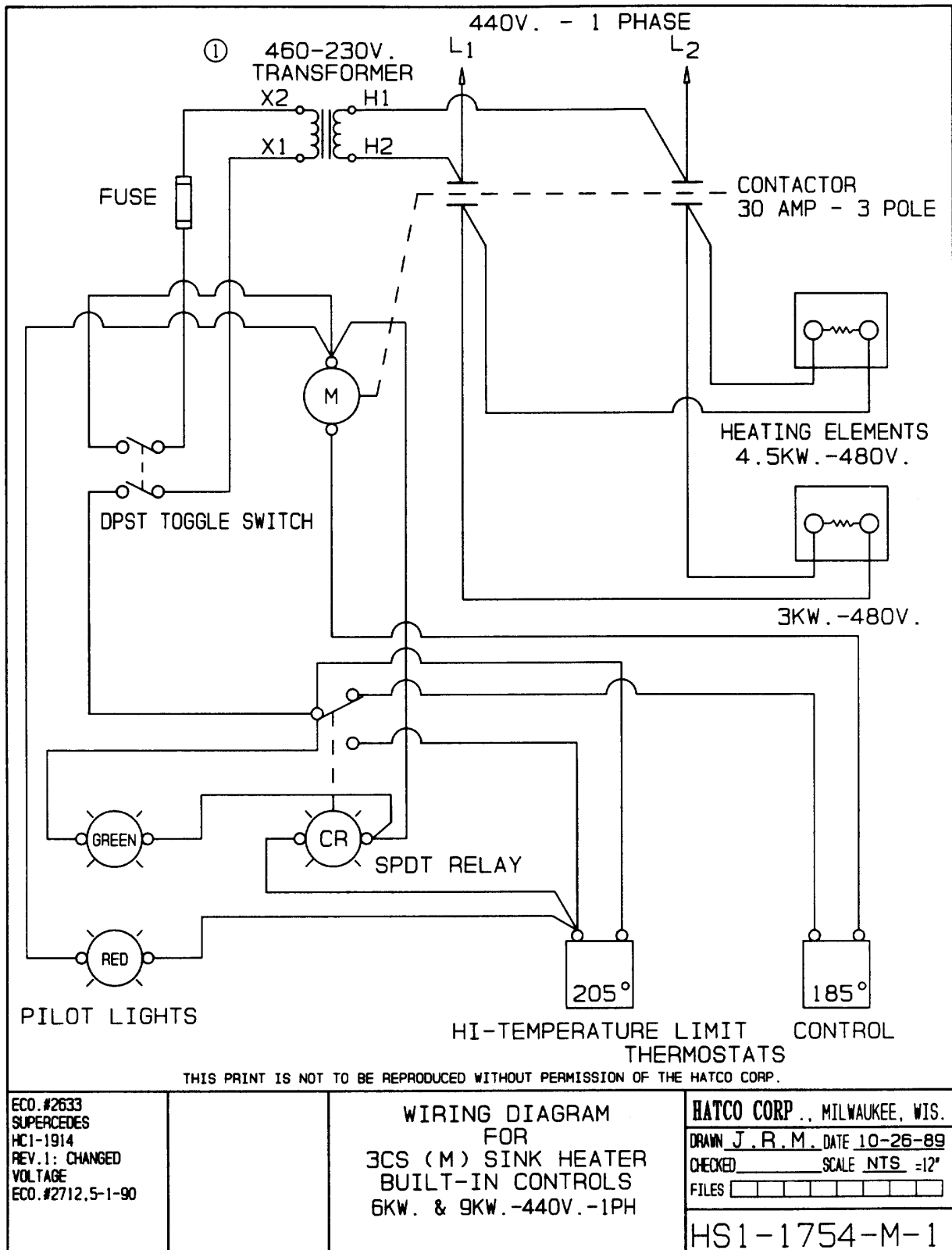
HS1-1755-M-1 WIRING DIAGRAM FOR 3CS (M) SINK HEATER BUILT-IN CONTROLS 6KW. -440V. - 3PH (BALANCE)



HS1-1750-M WIRING DIAGRAM FOR 3CS (M) SINK HEATER BUILT-IN CONTROLS 6KW. & 9KW. -208-240V. - 1PH

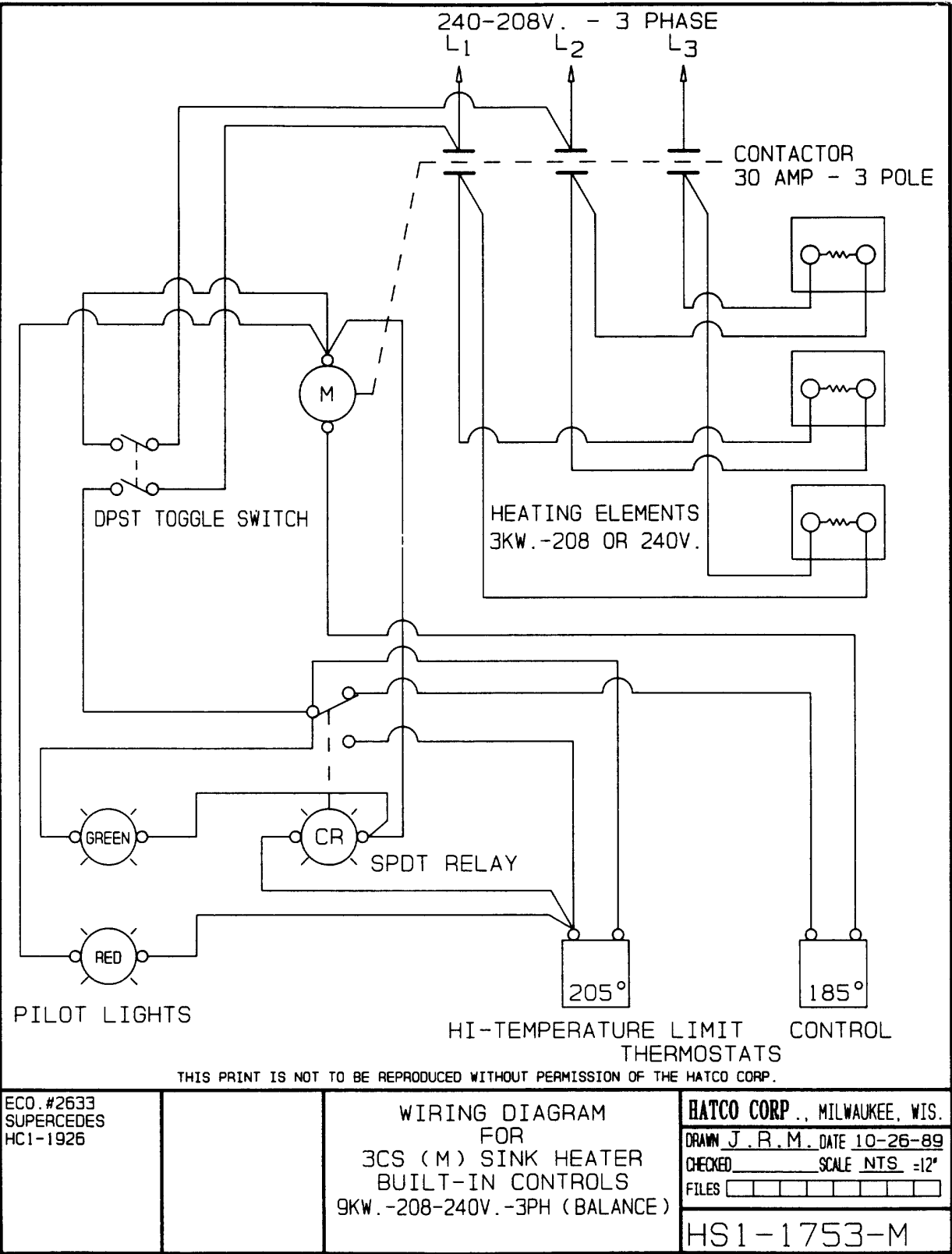






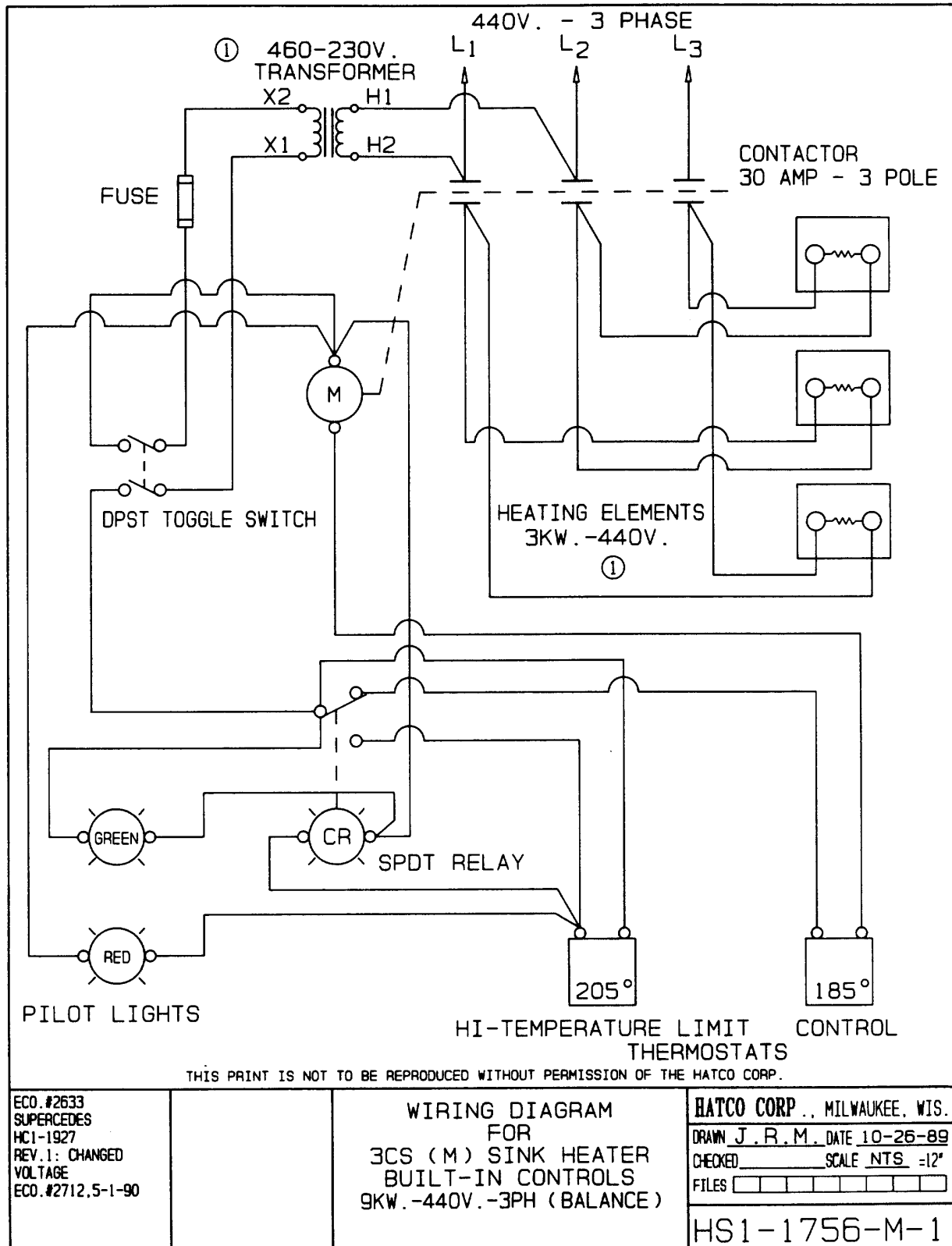
HS1-1754-M-1 WIRING DIAGRAM FOR 3CS (M) SINK HEATER BUILT-IN CONTROLS 6KW. & 9KW.  
-440V. - 1PH





HS1-1753-M WIRING DIAGRAM FOR 3CS (M) SINK HEATER BUILT-IN CONTROLS 9KW. -208-240V. - 3PH (BALANCE)





HS1-1746-M-1 WIRING DIAGRAM FOR 3CS (M) SINK HEATER BUILT-IN CONTROLS 9KW. 440V. - 3PH (BALANCE)

